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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,584	10/24/2003	Mukerrem Cakmak	089498-0447	9481

39905 7590 07/14/2005

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EXAMINER

LEE, RIP A

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,584

Applicant(s)

CAKMAK ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☒ This action is **FINAL**: 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action follows a response filed on April 28, 2005. Applicants have canceled claims 1-10 and have submitted new claims 11-20 for reconsideration.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,407,155 to Qian *et al.*

The prior art of Qian *et al.* relates to methods for making nanocomposite materials by forming a mixture of polymer matrix and nanoparticulate filler in the amount of 0.05-60 wt % and melt blending said mixture (claims 1 and 41). The filler is phyllosilicate clay, and it is nanoparticulate because the thickness of individual platelets is on order of Ångstroms (col. 5, line 34). The amount (0.05-60 wt %) of nanoparticulate filler is not expressed in terms of a volume percentage. However, in light of the fact that the range disclosed in the patent spans two orders of magnitude, it would have been obvious to one of ordinary skill in the art to believe that the 0.05-60 wt % range encompasses the recited ranges of 0.01-10 vol %, 0.1-10 vol %, and 1-10 vol % ranges set forth in the present claims. Since the specification does not provide a standard as to how such an amount may be determined, and since the PTO does not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

The nanocomposites of the invention are used in fabrication of films (col. 20, line 64), and Qian *et al.* teaches the technique of biaxial stretching of the film to increase dimensional stability (col. 21, lines 16-31). A measure of strain hardening is not elucidated in the reference, however, a reasonable basis exists to believe that such a phenomenon is imparted in the films of the invention, especially in view of the fact that the process outlined in Qian *et al.* follows that

described in the instant invention.[†] Since the PTO does not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

The remaining claims describe meaningful developments of the present invention, and these features are made obvious in the disclosure as follows:

Claim 12. The patent teaches use of polyolefins and polyamides (nylons), *inter alia*, as the host polymer (claim 16; example 8; col. 14 – col. 19, especially col. 16, lines 10-25). Clearly, these polymers also meet the generic description “aliphatic polymers, amorphous polymers, crystallizing polymers, and blends” of the instant claims.

Claims 13-15. The shape of the filler is best described as a platelet (col. 5, line 36), and this is considered a particle of irregular geometry. Each layer has thickness of about 3-50 Å, or 0.3-50 nm (col. 5, line 34). At least one dimension of the filler is in the nanometer range; therefore, the filler qualifies as a nanoclay. Specifically, montmorillonite clay that has been intercalated (*i.e.*, substituted) with onium ions is used as filler (col. 7, lines 36 – col. 8; line 61; example 1).

Claims 16-18. See discussion above.

Claims 19 and 20. The thermoplastic resin must be at least partially molten in order to effect strain hardening by stretching. To corroborate this notion, Qian *et al.* states that the composition is derived from melt blending. The film is the product prepared by the process.

[†] According to the current specification, it is the addition of nanoparticles that imparts novel strain-hardening characteristics to cast films (page 4, line 26). Stretching (uniaxially or multi-axially) of films so that the polymer chains become oriented in the stretch direction leads to strain hardening (page 6, lines 21-24).

Response to Arguments

3. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. Some of Applicant's remarks will be addressed.

It is submitted that Qian *et al.* does not suggest or teach a process for controlling strain hardening properties of a polymer. However, the claim is drawn to a process comprising three steps: blending, forming a film, and subjecting [the film] to strain hardening. These three steps appear to be disclosed in the prior art. The stress-strain curve of Figure 1 of Qian *et al.* serves as basis for establishing a *prima facie* case of obviousness, but it is not relied upon for quantitative evidence. Applicants indicate that the curves appear "substantially linear," yet, the figure resembles qualitatively any of the graphs shown in the instant specification, which appear just as "substantially linear" in the region of interest. Additionally, it is not clear how ductility relates to strain hardening. A strain-hardened object may be ductile if stretched appropriately. Presently, the burden of proof rests with Applicants to establish nonobviousness with regard to the notion that strain hardening in the polymeric films of Qian *et al.* does not occur as a result of biaxial stretching.

4. The rejection of claims under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,903,234 to Ikeda *et al.* has been withdrawn.

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Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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July 8, 2005



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